

Appl. No. : 10/603,425
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AMENDMENTS TO THE CLAIMS

1. (Previously presented) A filter laminate, comprising in any arrangement a plurality of discrete layers of material, wherein each layer is adjacent at least one other layer, said plurality of discrete layers comprising:

a first membrane layer comprising a first membrane, wherein said first membrane is a microporous or ultraporous asymmetric membrane, said first membrane having a first surface and a second surface, each of said surfaces comprising pores, and a support region between said first surface and said second surface, said first membrane comprising an asymmetric region comprising flow channels that gradually increase or decrease in diameter from a point in said support region to said second surface;

at least a second membrane layer comprising a second porous membrane; and
a porous bonding layer, wherein said porous bonding layer is a hot melt adhesive heat-bonded to said first membrane layer and to said second membrane layer.

2. (Canceled)

3. (Previously presented) The filter laminate of Claim 1, wherein said second membrane comprises an asymmetric membrane.

4. (Previously presented) The filter laminate of Claim 1, wherein said first membrane comprises a highly asymmetric membrane.

5. (Currently amended) The filter laminate of Claim 1, said first membrane having a first surface and a second surface, each of said surfaces comprising pores, wherein said pores of said second surface have an average diameter at least about 5 times greater than an average diameter of said pores of said first surface.

6. (Currently amended) The filter laminate of Claim 5 1, said first membrane having a first and a second surface, each of said surfaces comprising pores, wherein said pores of said second surface have an average diameter at least about 10 times greater than an average diameter of said pores of said first surface.

7. (Currently amended) The filter laminate of Claim 5 1, said first membrane further comprising a support structure between said first surface and said second surface, wherein said support structure comprises a reticular network of flow channels connecting said pores of said first surface with said pores of said second surface.

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8. (Original) The filter laminate of Claim 7, wherein said flow channels substantially increase gradually in diameter between said first surface and said second surface.

9. (Currently amended) The filter laminate of Claim 7, said first membrane further comprising an isotropic region ~~and an~~ in addition to said asymmetric region, such that said support region comprises a thickness between said first surface and said second surface, wherein said thickness comprises said isotropic region between said first surface and a point within said support region, and an asymmetric region between said point and said second surface, wherein said isotropic region comprises flow channels that are substantially constant in diameter from said first surface to said point between said isotropic region and said asymmetric region, and wherein said asymmetric region comprises flow channels that gradually increase or decrease in diameter from said point to said second surface.

10. (Original) The filter laminate of Claim 5, wherein said average diameter of said pores of said first surface is from about 0.01 μm to about 10.0 μm .

11. (Original) The filter laminate of Claim 5, wherein said average diameter of said pores of said first surface is less than about 0.01 μm .

12. (Canceled)

13. (Previously presented) The filter laminate of Claim 1, further comprising a third membrane layer.

14. (Previously presented) The filter laminate of Claim 13, further comprising a second bonding layer between the third membrane layer and either the first membrane layer or the second membrane layer, wherein said bonding layer is a hot melt adhesive heat-bonded to said third membrane layer.

15. (Previously presented) The filter laminate of Claim 1, wherein said first membrane comprises a polymer selected from the group consisting of polyvinylidene fluoride, polyarylsulfone, polyethersulfone, polyamides, and cellulosic derivatives.

16. (Original) The filter laminate of Claim 1, further comprising a layer comprising a material.

17. (Previously presented) The filter laminate of Claim 16, wherein said material is selected from the group consisting of polyester, polypropylene, polyolefin, polyethylene, nylon, paper, cellulose, glass fiber, and acrylic.

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18. (Original) The filter laminate of Claim 16, wherein said material is selected from the group consisting of nonwoven fibrous material, woven fibrous material, web material, sheet material, calendered material, wet laid material, dry laid material, and extruded material.

19. (Currently amended) A porous filter laminate, comprising in any arrangement:

a first distinct preformed layer of material, said first distinct preformed layer comprising a first membrane layer, said first membrane layer comprising a microporous or ultraporous asymmetric membrane, said microporous or ultraporous asymmetric membrane having a first surface and a second surface, each of said surfaces comprising pores, and a support region between said first surface and said second surface, said first membrane comprising an asymmetric region comprising flow channels that gradually increase or decrease in diameter from a point in said support region to said second surface;

a second distinct preformed layer of material, said second distinct preformed layer comprising a second porous membrane layer; and

a third distinct preformed layer of material, said third distinct preformed layer comprising a third membrane layer;

wherein each layer is adjacent to at least one other layer, wherein adjacent layers are secured by a porous bond, and wherein the bond is formed by a hot melt adhesive heat-bonded to said adjacent layers.

20. (Canceled)

21. (New) A filter laminate, comprising in any arrangement a plurality of discrete layers of material, wherein each layer is adjacent at least one other layer, said plurality of discrete layers comprising:

a first membrane layer comprising a first membrane, wherein said first membrane is an asymmetric membrane having a skin surface and an open surface, wherein pores of the open surface are larger than pores of the skin surface;

a second membrane layer comprising a second membrane, wherein said second membrane is an asymmetric membrane having a skin surface and an open surface, wherein pores of the open surface are larger than pores of the skin surface; and

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a porous bond between each of said adjacent layers, wherein said bond is between the skin surface of the first membrane and the skin surface of the second membrane, wherein the filter laminate has a higher bubble point than either the first membrane or the second membrane, and wherein the filter laminate has a greater integrity than a combination wherein the skin surface of the first membrane and the skin surface of the second membrane are adjacent to each other but not bonded to each other.